

Notice of Allowability

Application No.

10/577,694

Examiner

Ling-Siu Choi

Applicant(s)

GULEVICH ET AL.

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the Response filed October 12, 2007.
2. ☒ The allowed claim(s) is/are 1-10.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 10/03/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

DETAILED ACTION

1. This Office action is in response to the Response filed October 12, 2007. Claims 1-10 are now pending, wherein claims 1-7 are drawn to a catalyst component; claims 8-9 are drawn to a catalyst; and claim 10 is drawn to a process for (co)polymerizing olefins.

Allowable Subject Matter

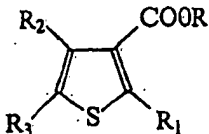
2. Claims 1-10 are allowed.

3. The following is an examiner's statement of reasons for allowance:

The present claims are allowable over the closest references: Kashiwa et al. (US 4,725,656) and Tajima et al. (US 4,525,555).

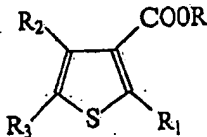
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Summary of claim 1:

A solid catalyst component for the polymerization of olefins comprising	
A	Mg
B	Ti
C	halogen
D	<p>an electron donor selected from thiophene derivatives of formula</p> <div style="text-align: center;">  </div> <p>R a branched alkyl group</p> <p>R₁, R₂, R₃ hydrogen, halogen, R⁴, OR⁴, COOR⁴, SR⁴, NR⁴₂, or PR⁴₂, wherein R⁴ is a linear or branched C₁₋₂₀ alkyl, C₂₋₂₀ alkenyl, C₃₋₂₀ cycloalkyl, C₆₋₂₀ aryl, C₇₋₂₀ alkylaryl, or C₇₋₂₀ arylalkyl group, optionally containing at least one heteroatom, and at least two of heteroatoms R₁-R₃ groups can also be joined to form a cycle, with the proviso that at least one of R₁ and R₂ is COOR⁴ and that when R₂ is COO-i-octyl and R is i-octyl, at least one of R₁ and R₃ are different from hydrogen</p>

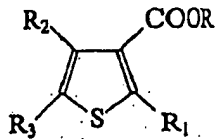
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Summary of claim 8:

A catalyst for the polymerization of olefins comprising	
A	a solid catalyst component comprising
	Mg
	Ti
	halogen
	an electron donor selected from thiophene derivatives of formula
	
R	a branched alkyl group
R ₁ , R ₂ , R ₃	hydrogen, halogen, R ⁴ , OR ⁴ , COOR ⁴ , SR ⁴ , NR ⁴ ₂ , or PR ⁴ ₂ , wherein R ⁴ is a linear or branched C ₁₋₂₀ alkyl, C ₂₋₂₀ alkenyl, C ₃₋₂₀ cycloalkyl, C ₆₋₂₀ aryl, C ₇₋₂₀ alkylaryl, or C ₇₋₂₀ arylalkyl group, optionally containing at least one heteroatom, and at least two of heteroatoms R ₁ -R ₃ groups can also be joined to form a cycle, with the proviso that at least one of R ₁ and R ₂ is COOR ⁴ and that when R ₂ is COO-i-octyl and R is i-octyl, at least one of R ₁ and R ₃ are different from hydrogen
B	an alkylaluminum compound, and optionally
C	at least one electron-donor compound (external donor)

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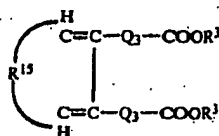
Summary of claim 10:

A process comprising (co)polymerizing olefins in the presence of a catalyst comprising	
A	a solid catalyst component comprising
	Mg
	Ti
	halogen
	an electron donor selected from thiophene derivatives of formula
	
R	a branched alkyl group
R ₁ , R ₂ , R ₃	hydrogen, halogen, R ⁴ , OR ⁴ , COOR ⁴ , SR ⁴ , NR ⁴ ₂ , or PR ⁴ ₂ , wherein R ⁴ is a linear or branched C ₁₋₂₀ alkyl, C ₂₋₂₀ alkenyl, C ₃₋₂₀ cycloalkyl, C ₆₋₂₀ aryl, C ₇₋₂₀ alkylaryl, or C ₇₋₂₀ arylalkyl group, optionally containing at least one heteroatom, and at least two of heteroatoms R ₁ -R ₃ groups can also be joined to form a cycle, with the proviso that at least one of R₁ and R₂ is COOR⁴ and that when R₂ is COO-i-octyl and R is i-octyl, at least one of R₁ and R₃ are different from hydrogen
B	an alkylaluminum compound, and optionally
C	at least one electron-donor compound (external donor)

Kashiwa et al. disclose a catalyst comprising (A) a magnesium-containing solid titanium catalyst component containing magnesium, titanium, a halogen and an electron donor, (B) an organoaluminum compound catalyst component, and (C) an outside

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electron donor which is an organic silicon compound, wherein the electron donor in the catalyst component (A) is a mono- or poly-ester of an aromatic polycarboxylic acid of the following formula



wherein R^{15} represents a divalent group which has at least one hetero atom selected from nitrogen and sulfur atoms and is selected from the group consisting of -S-, -S-CH₂-, -NH-, and -NH-CH₂-; Q_3 represents a direct single bond; R^3 represents a linear or branched alkyl group having 1 to 16 carbon atoms, preferably 2 to 8 carbon atoms, and at least one of the two R^3 in each formula is a linear or branched alkyl group having not less than 3 carbon atoms (col. 5, lines 11-38; claim 1). Thus, Kashiwa et al. do not teach or fairly suggest the claimed catalyst component (or catalyst), wherein the electron donor is the specific thiophene which has a branched alkyl carboxylate at 3-position and a hydrocarbyl carboxylate at 2 and/or 4 position.

Tajima et al. disclose a catalyst comprising (A) a solid catalyst component containing a solid substance and (4) a titanium compound supported on said solid substance, wherein the solid substance is obtained by contacting (1) a magnesium halide, (2) a silane, (3) at least one compound selected from the group consisting of: (a) $(\text{R})_q(\text{OR}')_p - \Phi - (\text{OH})_r$; (b) $\text{P}(\text{OR}^5)_3$; (c) oxygen-containing heterocyclic carboxylic acid esters; (d) nitrogen-containing heterocyclic carboxylic acid esters; (e) sulfur-containing heterocyclic carboxylic acid esters; (f) $\text{R}^6_i\text{Si}(\text{OH})_{4-i}$; (g) $\text{B}(\text{OR}^7)_u\text{X}_{3-u}$; (h) $\text{R}^8_2\text{SO}_{w+1}$, and

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(i) N-substituted urethanes; (B) an organometallic compound; and (C) a silicon-containing compound, wherein the sulfur-containing heterocyclic carboxylic acid ester include methyl thiophene-2,3-dicarboxylate or ethyl thiophene-2,3-dicarboxylate (col. 7, lines 1-2; abstract). However, Tajima et al. do not teach or fairly suggest the claimed catalyst component (or catalyst), wherein the electron donor is the specific thiophene which has a branched alkyl carboxylate at 3-position and a hydrocarbyl carboxylate at 2 and/or 4 position.

In light of the above discussion, it is evident as to why the present claims are patentable over the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ling-Siu Choi whose telephone number is 571-272-1098.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu, can be reached on 571-272-1114.

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L. S. Choi

LG-SUI CHOI
PRIMARY EXAMINER

December 15, 2007